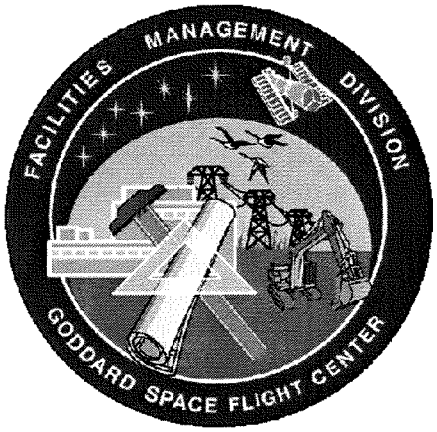
Mission Success Starts with Safety



SPECIFICATIONS FOR ARCHITECT-ENGINEERING SERVICES

August 19, 2010

GSFC Quality Policy

With customer satisfaction as our primary goal:

GSFC is committed to meeting or exceeding our customer's requirements

We achieve excellence in all of our efforts.

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1. INTRODUCTION

This Statement of Work (SOW) describes the requirements and specifications for the performance of the various Architect and Engineer (A&E) services required under this contract. Design services for this contract shall be for Non-Technical construction projects. Non-Technical projects are defined as facility restorations, office modifications, and underground infrastructure not including mission critical facilities such as Cleanrooms, Laboratories, Central Power Plant and Operations, and Mission Operations and Range Operations. Specific required services to be performed by the A&E shall be defined in the individual task order. Individual Request for Proposal (RFP) will be issued for each task by the Contracting Officer (CO).

1.1 Required Services:

The A&E shall provide the following services as required by the individual task order:

- Engineering and Special Studies
- Preliminary Engineering Reports (PERs)
- Final Design
- Follow On Services

The A&E shall prepare and furnish to the CO and the Project Manager (PM), all deliverables and services within the required dates and budgets set by the individual task order.

1.2 Task Description:

Descriptions and overall project scope of work shall be provided on an individual basis for each task ordered. As part of each ordered task, the Government shall provide as a minimum to the A&E the NASA Forms NF 1509 (Facility Project – Brief Project Document) and NF 1510 (Facility Project Cost Estimate). These documents provide the description, the justfication and basis of need, the budget, and schedule for the project.

1.3 Funding:

The basis for the A&E fee for each individual task shall be the Engineering Estimate (EE). The EE will include the intended cost of construction, adjusted to the midpoint of construction, and the construction contractor's overhead, profit, and bond. The EE shall be included on the NF 1509 and NF 1510.

The Government will provide to the A&E the Project Budget which includes the EE, construction contingency, construction management fees or Supervision, Inspection, and Engineering Services (SIES), and other burden costs.

1.4 Schedule:

Upon successful award of the task to the A&E and prior to the Kickoff Meeting (see 2.15), the A&E shall provide to the Government an overall task schedule plan outlining all of the required services and deliverables with due dates in accordance with this SOW and the individual task requirements. The design schedule shall comply with the NF 1509 established dates. The schedule shall include the order in which the A&E proposes

to complete the work and the start and completion dates for the services ordered. The schedule shall also include appropriate review time by the Government, review meeting dates, and dates for returned review comments by A&E. The schedule shall be updated by the tenth day of each month to show the actual progress against the original schedule, including discussion of the monthly status and progress. The A&E shall include an explanation of any deviation to the anticipated completion for each discrepant item. Schedule discrepancies shall require approval by the Contracting Officer.

The schedule shall be provided in accordance with the Delivery Schedule.

1.5 Quality:

The A&E shall provide complete, thoroughly coordinated, and accurate design documents suitable for facility construction. All designs, documents, and deliverables shall be performed in a manner consistent with professional architectural and engineering practices and consistent with the principles of maximum economy in design techniques, the use of materials, and construction methods.

1.6 Safety:

The A&E shall perform work in accordance with their approved Health and Safety Plan. In addition, the A&E must understand the hazards that are present to which they may be exposed particularly during site investigations, testing or evaluations performed, or during the performance of follow on services. Individual job hazards shall be acknowledged and addressed in their Health and Safety Plan.

1.7 Design within Funding Limitations:

Per FAR 52-236-22, the A&E shall provide a complete and biddable design that is within the funding limitations established in the Government's Engineering Estimate. Funding for each task is strictly limited to these budgets and cannot be exceeded, therefore; it is imperative that the design for the project be kept within the specified amount. If at any time during the preparation of the design or construction documents, the requirements appear to the A&E to be inconsistent with the funding available, such inconsistency shall be promptly reported to the Contracting Officer (CO) and Contracting Officer's Technical Representative (COTR) as well as the Project Manager (PM) for proper action.

2. GENERAL CONDITIONS

2.1 Communications:

The A&E shall consult and advise the CO, PM and COTR, when requested, regarding any questions which may arise in connection with the work under this contract for each task. For each task, the A&E shall record minutes of all meetings, design reviews, telephone conversations, emails, or other discussions in which substantive decisions have been made regarding the design concept, budget, quality, or schedule. Copies of these records shall be provided to the CO for review and approval.

2.2 Government Furnished Property and Services

2.2.1. Task Scope of Work:

The Government will furnish a SOW for each individual task. The SOW will include a copy of the NF 1509 and NF1510. The SOW will define the services required as defined in Section 1.1 of this document.

2.2.2. Documentation:

The Government will furnish all available drawings and files showing as-built conditions in the vicinity of the work defined for the task. Acceptance of the drawings does not relieve the A&E of the responsibility for site investigations for verifing existing conditions.

2.2.3. Final Printing of Bidding Documents:

The Government will be responsible for the reproduction and distribution of all final construction bid documents. The A&E is responsible for electronic and hard copies of all deliverables as further required in each individual task.

2.2.4. Contract Bidding, Award, and Administration of the Construction Contract:

The Government will be responsible for any contract bidding, award, and administration of construction contracts.

2.2.5. Quality Assurance of Construction Activities:

The Government will be responsible for Quality Assurance monitoring of the construction activities unless specifically addressed in the individual task under Follow On services.

2.2.6. Reference Documents:

The Government will provide the following reference documents to the A&E. The A&E is responsible for adherance to all referenced documents in this SOW and shall bring to the attention of the CO, PM and COTR any discrepancies in these documents.

2.2.6.1. Standard Reference Document:

The Government will provide an electronic copy of the Facilities Management Division (FMD) Standard Reference Document (SRD) for all work at the Greenbelt facility. The SRD established design guidelines and standards for work at the Greenbelt facility only. The A&E is required to perform all work in accordance with the most recent version of established national design codes regardless of where work will be performed. Discrepancies between the SRD and these established national design standards shall be brought to the attention of the COTR and PM for resolution.

2.2.6.2. NASA Specs-in-Tact:

The Government utilizes the latest version of the Specs-in-Tact specification program. The Government will furnish to the A&E an electronic copy of any GSFC specific local sub-masters.

2.2.6.3. CADD Manual:

The Government will furnish the A&E a copy of the FMD CADD Manual. This document provides the layering conventions and standards required for all CADD

documentation. For Wallops Flight Facility (WFF), use the U.S. National CAD Standard publication available through the Army Corps of Engineers.

2.2.6.4. Wallops Flight Facility (WFF) specific documentation:

All site drawings shall be drafted to VA HARN State Plane Coordinate System in US Survey Feet. No other specific documentation has been provided at this time, however; the Government reserves the right to provide specific documentation at a later date.

2.2.7. Facility Hazard Analysis (FHA) and Preliminary Hazard List (PHL):

The Government may provide the A&E an electronic copy of the FHA and PHL if one exists. For certain tasks, the A&E may be responsible for generating this list and analysis. (See 3.0)

2.2.8. Redline Drawings:

The Government will provide redlined as-built construction drawings to the A&E as required for individual tasks. For these tasks, the A&E will be required to update the FMD electronic as-built to reflect the redlined as-built provided by the construction contractor.

2.2.9. Fire Hydrant Flow Test Data:

The Government will provide fire hydrant flow test data to the A&E in the vicinity of the task location as needed. The data shall be used by the A&E to design the fire protection system. The A&E may be required to verify data provided as needed as determined by each individual task order.

2.2.10. Records of Construction Documentation:

The Government will furnish to the A&E copies of all Government approved construction documentation related to the A&E's task for Follow-on services to include but not limited to Requests for Information (RFI's), Material Submittals, and pertinent change orders. The Government is responsible for final approval of all construction documentation.

2.3 Partnering:

As required by individual task, the A&E will be required to participate in "Partnering" sessions with the Government during the design and construction of the task. The partnering parties will vary but may include the Government, the A&E, outside facilitators, construction contractors, and other parties as deemed by the Government. The purpose of partnering is to forge a smooth operating team, capable of resolving differences quickly and without recourse of legal remedies. Specific partnering requirements will be defined in the individual task. Portions of the partnering task will not be reimbursable by the Government such as food and lodging purchases.

2.4 Government Ownership of A&E Documentation:

Upon submission and approval of the final documentation as required by each task, all work, including the entire design, drawings, specifications, calculations, cost estimates, reports, electronic files, models, and other documents produced under this contract,

whether or not they are specified deliverables, shall become the property of the Government.

2.5 Permits and Licenses:

Unless specifically stated in the individual task, the A&E shall obtain all necessary permits, licenses, and approvals from all local, State, and Federal authorities as necessary for the performance of construction.

2.6 Environmental:

All services rendered under this contract and for each individual task shall be performed in accordance with all applicable federal, state and local environmental laws, regulations, and Executive Orders. Services shall also be performed in accordance with the most recent versions of NASA and GSFC specific environmental requirements and GSFC environmental permits and plans. References are available on-line. Specific NASA and GSFC environmental requirements include, but are not limited to the following:

- 14 CFR 1216.3 Procedures for Implementing the National Environmental Policy Act (NEPA)
- NPD 8500.1, NASA Environmental Management
- NPR 8530.1, Affirmative Procurement Program and Plan for Environmentally Preferable Products.
- NPR 8553.1, NASA Environmental Management System (EMS)
- NPR 8570.1, Energy Efficiency and Water Conservation
- NPR 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114
- GPD 8500.1, Environmental Program Management
- GPR 8500.1, Environmental Planning and Impact Assessment
- GPR 8500.3, Waste Management
- GPR 8500.4, Air Quality Management Program
- GPR 8500.5, Water Management

GSFC (Greenbelt location) permits include, but are not limited to the following:

- Air Program, Title V Operating Permit
- Water Program
    - National Pollutant Discharge Elimination System (NPDES) Industrial Discharge Permit
    - NPDES Small municipal separate storm sewer systems (MS4) Permit
    - Oil Operations Permit
    - Washington Suburban Sanitary Commission (WSSC) Discharge Authorization Permit
    - (06HT) General Permit for Discharges from Tanks, Pipes, and Other Liquid Containment Structures

GSFC (Greenbelt location) plans include, but are not limited to the following:

- GSFC-Greenbelt Integrated Contingency Plan
- GSFC-Greenbelt Stormwater Pollution Prevention Plan

GSFC (Wallops Flight Facility location) Permits

- Virginia Pollutant Discharge Elimination System (VPDES) Process and Stormwater Discharge Permit
- Virginia Department of Health Waterworks Operation Permits
- Clean Air Act Permits
- Oil Operations Permit
- WFF Hazardous Waste Permits

GSFC (Wallops Flight Facility) plans include, but are not limited to the following:

- WFF Integrated Contingency Plan
- WFF Stormwater Pollution Prevention Plan
- WFF Oil Discharge Contingency Plan
- WFF Integrated Cultural Resources Management Plan

Unless specifically stated in the individual task, the A&E shall prepare documentation for all applicable environmental requirements for approval by the Government. The A&E shall submit these documents to the appropriate reviewing and approving Agency. The A&E shall include necessary lead times for approval of this documentation in their overall schedule. All services rendered under this contract and for each individual task shall be performed in accordance with all nationally recognized environmental standards and in accordance with all NASA specific environmental standards. Specific NASA environmental standards that shall be adhered to include but are not limited to the following:

- Executive Order (EO) 12114 - Environmental Effects Abroad of Major Federal Actions.
- 14 CFR Part 1216 - Environmental Quality.
- NASA Policy Directive (NPD) 1820.1 - NASA Environmental Health Program.
- NPD 8500.1 - NASA Environmental Management.
- NASA Procedural Requirements (NPR) 8530.1 - Affirmative Procurement Program and Plan for Environmentally Preferable Products.
- NPR 8553.1 - NASA Environmental Management System (EMS).
- NPR 8570.1 - Energy Efficiency and Water Conservation.
- NPR 8580.1 - Implementing the National Environmental Policy Act (NEPA) and Executive Order 12114.

2.7 Safety:

All services rendered under this contract and for each indivdual task shall be performed in accordance with all nationally recognized safety standards and in accordance with all NASA specific safety standards. Services shall be performed in accordance with the most recent versions of NASA and GSFC safety standards. NASA references are available on line. All designs must be reviewed and approved by the NASA Authority Having Jurisdiction (AHJ). Specific NASA safety standards that shall be adhered to include and are not limited to the following:

- NFPA 10 - National Fire Protection Association (NFPA) Standard for Portable Fire Extinguishers.
- NFPA 13 - NFPA Standard for Installation of Sprinkler Systems.
- NFPA 14 - NFPA Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems, 2000.
- NFPA 71 - NFPA Central Station Signaling System.
- NFPA 72 - NFPA Fire Alarm Code.
- NFPA 75 - NFPA Standard for the Protection of Electronic Computer/Data Processing Equipment.
- NFPA 78 - NFPA Lightning Protection Code.
- NFPA 70 - NFPA National Electrical Code.
- NFPA 90A - NFPA Standard for the Installation of Air-Conditioning and Ventilating Systems.
- NFPA 101 - NFPA Safety to Life from Fire in Buildings and Structures.
- NFPA 204 - NFPA Guide for Smoke and Heat Venting.
- NASA-STD 1740.12 - Safety Standard for Explosives, Propellants, and Pyrotechnics.
- NASA-STD 8719.7 - Facility System Safety Guidebook.
- NASA-STD 8719.9 - Standard for Lifting Devices and Equipment.
- NASA-STD 8719.10 - Safety Standard for Underwater Facility and Non-Open Water Operations.
- NASA-STD 8719.11 - Safety Standard for Fire Protection.
- NASA-STD 8719.17 - NASA Requirements for Ground-Based Pressure Vessels and Pressurized Systems.
- NPD 8700.1 - NASA Policy for Safety and Mission Success.
- NPD 8710.5 - NASA Safety Policy for Pressure Vessels and Pressurized Systems.
- NPR 8715.3 - NASA General Safety Program Requirements.

2.8 Security:

All services rendered under this contract and for each individual task shall be performed in accordance with all NASA Security standards including but not limited to the following:

- NPR 1600.1 - NASA Security Program Procedural Requirements.
- NPR 1620.2 - Physical Security Vulnerability Risk Assessments.
- NPR 1620.3 - Physical Security Requirements for NASA Facilities and Property.
- NPD 1600.3 - Policy on Prevention of and Response to Workplace Violence
- GPR 1600.1 - Goddard Security Requirements.

NASA References available on line. Goddard GPR 1600.1 will be made available to A&E as required.

2.9 Facililites Standards:

All services rendered under this contract and for each individual task shall be performed in accordance with all NASA Facilities and industry standards including but not limited to the following:

- NPR 8820.2 - Facilities Project Implementation Guide.
- FMD Standard Reference Document (SRD) - Greenbelt only.
- FMD CADD Manual.
- NASA Specs-in-Tact.
- EO 13423 - Strengthening Federal Environmental, Energy, and Transportation Management.
- Code of Federal Regulations (CFR) Part 434, Title 10, Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings.
- 36 CFR 800 - Protection of Historic Properties, of the National Historic Preservation Act (NHPA).
- NPD 8820.2 - Design and Construction of Facilities.
- NASA Project Definition Rating Index (PDRI) Manual.
- Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding, dated January 2006.
- 2006 International Building Code (or latest version)
- AWWA Criteria
- MUTCD Criteria
- AASHTO Criteria
- NFPA Criteria

References listed above that are not provided in paragraph 2.2.6 are available on line.

2.10 Project Definition Rating Index (PDRI):

The A&E shall participate in the establishment of the PDRI at the the conclusion of the Preliminary Engineering Report (PER – See 4.0) phase and the 30% design review as required for each individual task. The PDRI is an analytical approach to evaluating the inclusion of all requirements and design considerations from all NASA stakeholders.

2.11 Leadership in Energy and Environmental Design (LEED):

For tasks where LEED is required, the A&E shall design in order to achieve a Silver rating. The A&E shall identify all LEED potential points and submit to the Government as part of the pre-design serivces. The Government will meet with the A&E to discuss and review options including developing sustainable strategies not necessarily identified by the United States Green Building Council (USGBC) guidelines. The A&E shall provide all design documentation required and make appropriate submissions to the USGBC as part of their design services. For identified tasks, the A&E shall track the LEED status of the project through construction

submitting final applications on behalf of the Government. Registration fees for the task shall be paid for by the A&E.

2.12 Building Information Modeling (BIM):

For tasks where BIM is required, the A&E shall provide design services utilizing BIM. NASA GSFC has not established BIM standards as of this solicitation but is seeking to pursue BIM and develop these standards in the future. As standards are developed and implemented, the A&E contracts and this Statement of Work will be modifed.

2.13 Cost Estimates:

The A&E shall provide the construction cost estimate (Engineering Estimate – EE) in a format consistent with Construction Specifications Institute (CSI) format or other format as described in the task. Upon submission of first cost estimate, the A&E shall provide the basis for the cost estimate including any area market research justifying costs shown. Cost estimates shall not be based soley on "canned" software programs but shall reflect current market trends and labor and material cost information pertinent to the locality where the task will be performed. The cost estimate shall also consider other unique information such as other known work in the area and unique factors that might affect costs such as Davis Bacon wages, GSFC security requirements, GSFC safety regulations, and GSFC environmental regulation, location of work, and complexity of work.

2.14 Pre-Proposal Conference:

Once the A&E is downselected for the individual task, the A&E shall meet with the CO and PM prior to proposing on any individual task in order to completely understand the requirements. The pre-proposal conference will fully address the task scope of work, the project budget, review supporting documents, and review all anticipated deliverables and schedules required for the project.

2.15 Kickoff Meeting:

Upon sucessful award of the task to the A&E, the A&E shall meet with the Government to review the A&E's proposed schedule for the task deliverables. The A&E shall use this time to acquaint staff members with FMD staff engineers, Operations and Maintenance staff, Safety, Security, and Environmental staff members. This meeting will also include the ultimate end customer/user of the proposed facility. If required by the individual task, the kickoff meeting may also serve as or be coordinated with the initial A&E Partnering meeting.

2.16 Site Investigations:

The A&E shall visit each task site to become familiar with all available documentation concerning the location, nature of, general requirements for, and special features of the work involved, including verification of all existing conditions in the areas to be modified and /or disturbed, including underground utilities. In addition, the A&E shall become familiar with the site design and improvements, all utilities, and the building plans for the exisiting facilities affected by each task. The A&E is responsible for researching the existing documentation at GSFC (including exisiting drawings, specifications, as-builts, and submittal

information, calculations, etc) to obtain all necessary information for the design of each project.

3. ENGINEERING AND SPECIAL STUDIES

Engineering and Special Studies will be identifed and requested in the individual task. The purpose of a study is different than that of a task for design services or Preliminary Engineering Requirements (PERs) which focus more on the construction or modification of a facility. Studies are used to assist FMD in analyzing, investigating, reviewing, and assessing GSFC (Greenbelt and Wallops Flight Facility) facilities and related systems. Studies may also be used in the planning and development of new requirements including preparing feasibility studies. Studies may also be used to assist other organizations such as the FMD Operations and Maintenance Branch, the Occupational Safety and Health Division, the Medical and Environmental Management Division, and the Security Divison. A non-comprehensive list of studies that may be performed include the following:

- Feasibility studies for new facilities program and project requirements
- Cost estimates
- Site Surveys
- Geotechnical Reports
- Schedule development
- Requirements development
- Environmental studies including but not limited to:
    - NEPA documentation
    - Forest Conservation Plans
    - Wetland Delineation Studies
    - Hazardous waste surveys
    - Stormwater Management Plan and Report
- Life Safety and Safety studies including but not limited to:
    - Preliminary Hazard Lists (PHL) development
    - Facility Hazard Analysis (FHA)
    - Hazard Analysis Tracking Index (HATI)
    - ADA compliance studies
    - Building Code compliance studies
- Physical Security studies
- Condition Assessments
- Specification development
- New Technology Implementation studies (BIM, GIS, CADD, others as determined in task)
- Economic and Life Cycle Cost analysis
- Operation and Maintenance studies
- Structural Investigations
- Underground Utility and Subsurface Investigations
- Planning studies

Study format shall be determined by the individual task requirements. Schedule, deliverables, number of submissions, etc., will be determined by the individual task. See 7.2 for general schedule of deliverables.

4. PRELIMINARY ENGINEERING REPORTS (PERs)

The PER shall be required as detailed in the individual task order. PERs are common for projects of significant technical or financial risks associated with them (e.g., employing leading-edge technology, highly technical, complex, or with incremental funding). The PER will include the following sections:

4.1 Section I: Requirement Statement and Justification:

Describe and justify the project requirements, problems, and milestones. Center directives will be referenced to support the requirements and required completion date.

4.2 Section II: Descriptive Analysis:

The problems and solutions identified must be explained with sufficient detail to adequately make rational decisions. Include schematics and one-line diagrams showing the functions and operations to be performed within the facility. A life-cycle cost analysis that meets the requirements of paragraph 2.2.4.12 of the NPR 8820.2F, Budget and Approval Documents, must be developed and provided for each alternative. Each alternative will include discussions on the pros, cons, risks, and analyses for meeting the project requirements including safety, fire protection, energy conservation, environmental, operations and maintenance considerations, and sustainability. Where applicable, each alternative must include information on architectural, site development, structural, mechanical, and electrical considerations; real estate actions; and any affected utilities. If there are no real estate requirements, it must be clearly stated in this section.

4.3 Section III: Engineering, Budget, and Other Estimates:

The PER cost estimates will be prepared on NASA Form 1510, Facility Project Cost Estimate, in accordance with Appendix C, Forms and Instructions of the NPR 8820.2F. The cost estimating process includes Engineering Estimates (EE), budget estimates, and other cost estimates.

4.3.1. The Engineering Estimate (EE): This represents the Construction of Facilities (CoF) costs developed from the draft project documents (drawings and specifications) prepared for the PER. The estimate includes the costs for materials, labor, real estate actions, and services, including contractor overhead and profit escalated to the mid-point of construction. Adequate design contingencies must be included. The EE must include all labor and material costs for all items including collateral equipment that would normally be furnished by a contractor and installed as permanent in the facility. When applicable, the cost to install Government Furnished Property (GFP) will be included. The EE must not include construction contingencies, or Supervision, Inspection, and Engineering Services (SIES). The basis or source used will be indicated on the estimate. Estimates will identify funding requirements by fiscal year(s) and amount(s). The EE must include unit costs (e.g., units of measure and quantities for each significant item) instead

of lump sum estimates whenever feasible. The EE is the estimate used for comparing alternatives within the PER.

4.3.2. Operations and Maintenance (O&M) Cost: An O&M cost estimate covering the expected life of the facility must be included for each feasible alternative in the PER. This cost estimate will include recurring costs for each alternative included utility and operations and maintenance costs for installed systems over the expected life of the facility.

4.3.3. The Budget Estimate or Project Estimate: This estimate includes the EE of the selected alternative, construction contingencies, commissioning services, and SIES. This estimate will follow the same guidelines for unit costs as outlined in the prior paragraph. The total budget estimate becomes the budget amount (BA) after it has been submitted to OMB and is the BA for this project on all future reports to HQ.

4.3.4. Other Cost Estimate: Project requirement costs not covered in the prior three paragraphs should be included within the PER, but annotated separately. For example, non-real property equipment, furniture, and telecommunications equipment required to meet the project goals and objectives fit under this heading.

4.4 Section IV: Design and Construction Schedule:

Provide a project schedule using MS Project. If a predetermined need date has been established for the facility, it shall be shown in the schedule. The schedule must address requirements for other Architectural-Engineer (A&E) services, long lead items, special approvals, other special requirements. If more than one construction contract is contemplated, an estimate of the time required for each major contract and the phasing will be provided. The schedule must include the estimated number of months required for each of the following:

- Preparing the final design documents
- Construction acquisition
- Construction
- Facility activation

The dates shall be recorded on the NASA Form 1509 (Facility Project – Brief Project Document) in accordance with Appendix C, Forms and Instructions of the NPR 8820.2F.

4.5 Section V: Appendices to the Report:

4.5.1. Drawings: As required for clearly illustrating the project, drawings for the PER will include a location plan, site plan, single-line floor plans, and elevations. On the drawings, particular attention must be paid to illustrate effective land use. Any proposed land-acquisition requirements, including easements, must be indicated on the site plan. Required safety clearance distances, when applicable, must be shown on the site plan.

4.5.2. Ancillary Investigations: Any supplementary investigations or studies used to enhance, develop, or eliminate alternatives, such as soil conditions, environmental studies, marketing strategies, or feasibility studies, must be either attached to or summarized in the appendices.

4.6 Architectural Design Review Committee (ADRC)

As required by individual task, the A&E shall prepare documentation for presentation to the ADRC as outlined in the Standard Reference Document (SRD). Section is non-applicable for Wallops Flight Facility.

4.7 National Capitol Planning Commission (NCPC)

As required by individual task, the A&E shall prepare documentation for presentation to the NCPC as outlined in the Standard Reference Document (SRD). Section is non-applicable for Wallops Flight Facility.

5. FINAL DESIGN

5.1 General Statement:

The design of architectural, civil, structural, mechanical, Utility Control System (UCS), sprinkler system, plumbing and process systems, electrical, Power Monitoring Control System (PMCS), smoke, fire detection and alarm system, and security system shall provide a safe facility adequate for its intended uses.

5.1.1 Environmental:

The A&E shall assess the need for environmental requirements (Stormwater Management and Sediment/Erosion Control, Wetlands Investigation, National Environmental Policy Act (NEPA) Compliance, Forest Conservation, and Air Quality) to conform to all applicable local, state, and federal requirements relating to environmental issues. Recommendations, design (plans, calculations, forms), and associated costs of implementation shall be prepared and provided when necessary. The A&E is responsible for all submittals to the Environmental Agencies unless stated otherwise in the individual task order.

5.1.2 Hazardous:

Design related to Hazardous Material shall include the identification of lead, asbestos, mercury, PCB's, and other hazardous materials through surveys performed by a licensed contractor(s), determining the impact of the hazardous materials to the specific project, and producing a plan to mitigate risks (i.e.- abatement, encapsulation, etc.) with project related specifications on engineering controls and method of abatement/encapsulation. Specifications for Asbestos abatement or encapsulation may only be edited by a licensed Asbestos Project Designer.

5.1.3 Civil:

The civil design shall include demolition, parking lots, roads, drainage and grading, temporary and permanent dewatering, sediment and erosion control, site utilities, sidewalks, retaining walls, and other site-related services as required.

5.1.4 Landscaping:

The landscaping design shall include demolition, monuments, landscaping, plantings, and other aesthetic features.

5.1.5 Structural:

Structural designs shall include all structural systems (systems which support or resist loads) related to transportation, buildings and misc. structures (i.e.-towers), and utilities. Designs include but are not limited to building foundations, flooring systems, building wall systems, columns, roofing systems, retaining walls, and towers (monopole, guyed, or self supported). Designs must follow the most stringent of all applicable federal and state codes.

5.1.6 Architectural:

The architectural design shall ensure an efficient and functional facility that becomes a visual asset to the surrounding environment. It shall describe a quality facility, buildable without expensive or extraordinary efforts. Systems shall include exterior and interior walls and fenestration, floor systems, finishes, roofing, ceiling, hardware, stairs, lavatories, doors and windows, and other special systems as may be part of the project scope. In certain circumstances, the architectural design shall include LEED certification and incorporate historic preservation standards.

5.1.7 Fire Protection:

The design of fire protection systems (smoke, fire detection, and alarms) shall conform to all applicable codes. The drawings shall indicate the locations of standpipes and major fire protection piping runs, and the extents of each zone, as well as the required hazard/class of coverage. The A&E shall include flow test data provided by the Government where necessary for the construction contractor's hydraulic calculations. The A&E shall perform calculations to show that the proposed utility point of connection will be adequate for fire protection of the facility. The A&E is not required to identify the sprinkler branch-piping layouts. As determined by the individual task order, an air aspirating system may be required in critical areas.

5.1.8 Plumbing:

The plumbing design shall include sanitary sewer, domestic cold and hot water, roof drainage, compressed gasses, or other specialized systems, as required.

5.1.9 Mechanical:

The mechanical design shall include Heating, Ventilation, and Air-Conditioning (HVAC), Utility Control System (UCS), and mechanical piping, and all other mechanical systems identified in the programming stage. HVAC shall include but limited to chillers, cooling towers, air handlers, fans, ductwork, steam, chilled water, heating hot water, and mechanical site utilities. Environmental systems shall provide for the comfort, safety, and health of occupants while maximizing efficiency.

5.1.10 Electrical:

The electrical design shall include power distribution; grounding, building and site lighting, lighting controls, lightning protection, UPS, site electrical utilities, and other related electrical services associated with building and facilities equipment. The design shall include empty conduit, cable trays, ducts, and closets for data processing, and communications systems. Telecommunication design shall include empty conduits, cable trays, ducts, and closets for

telecommunication (telephone, LAN, data, etc.) systems. Security System design shall include empty conduit, cable trays, ducts, and closets for security systems.

5.1.11 Utility Control System (UCS):

The UCS shall be designed by the A&E to include all control systems required for the project. The A&E shall ensure that design is compatible with the GSFC UCS standards. The UCS standards and guide specification will be provided to the A&E as needed for each individual task. The UCS shall also include intelligent lighting control and engineered smoke control if included in the project scope.

5.2 Construction Schedule:

A&E shall provide an estimated construction Gantt style Critical Path Method (CPM) Schedule. The A&E shall use MS Project for the Schedule and shall indicate all major work elements, properly sequenced, to indicate the most probable construction duration.

5.3 Equipment Data Books:

Equipment Data Books shall contain detail copies of all design data developed and used in the selection of mechanical, electrical, and other building equipment for the preparation of the construction drawings and specifications. Electrical and mechanical equipment cut sheets shall be labeled and cross-referenced to the floor plans, and shall clearly show selected equipment which meets the calculated performance requirements. The data shall be provided in 3-ring loose-leaf binders, with table of contents, and shall include such diagrams and sketches as are pertinent to explain intent. Equipment data shall be clearly marked and indicate which model, features, and other options are included in the project.

5.4 Architectural Color Book:

Architectural color book shall include samples of all finish materials to be used, indicating texture, color, and form. Color book materials shall be in 3-ring loose leaf binders or 24" x 36" Color Board or as indicated in the individual task.

5.5 Pre-Final Design Documents:

Unless otherwise specified in the task, Pre-final reports, analyses and drawings submitted at 35 percent, 60 percent, 90 percent, and 100 percent submissions shall be standard black and white copy quality, Arch size D (24" x 36"), suitably bound.

5.6 35% Construction Documents:

5.6.1 Environmental Requirements

Environmental Assessments shall be complete and ready for public review; including advertising and distribution. Wetlands impact analysis shall be complete with a Joint Application ready for submission to the Maryland Department of the Environment (MDE). Preliminary Forest Stand Delineation and Forest Conservation Plan shall be prepared. Preliminary Permit to Construct Application shall be prepared for relevant air

emission units. Unless specified otherwise, the above requirements in 5.6.1 will be required.

5.6.2 Specifications:

The specifications shall contain the project Table of Contents and section Tables of Contents.

5.6.3 Drawings:

Drawings shall be fully developed to 35 percent level giving clear indication and presentation of design approaches for ALL disciplines. All disciplines shall be provided with accurate legend and symbol designation sheets.

General drawings shall include title sheet and standard legend and abbreviation sheets.

Hazardous material drawings shall show location of hazardous materials impacted by work related to a project. Notes on drawing shall describe nature and type of hazardous material and refer to specification sections describing the mitigation (abatement/encapsulation) of the specific materials.

Civil drawings shall provide topographic survey plans with all relevant features, appurtenances and controls. Demolition plans indicating items to be removed, site layout plans with building, parking lot and other site features dimensioned and located, preliminary grading/drainage plans, utility plans with utilities located, utility profile plans showing existing utilities, preliminary detail sheets, boring logs and geotechnical information sheet, preliminary sediment control plans and storm water management analysis.

Landscaping drawings shall include areas of plantings, indicating generalized types.

Structural drawings shall provide foundation plans, developmental footing schedules, slab plans, framing plans with top of steel elevations, elevation plans, typical framing details, and preliminary sections and details. Developmental column, pedestal, base plate, and footing schedules and General Structural notes indicating design loads and loading, structural codes and standards, and materials information shall be provided. Plans shall be dimensioned with column grid spacing. Plans shall show design assumptions (i.e.- Building Category, Design Wind Loading, Snow Loading, Exposure Category, Floor Design Loads, Live loads, and other collateral loads.)

Architectural drawings shall provide plans for all floors, with exterior wall thicknesses fixed; structural grid shall be fixed; overall dimensions shall be provided, including setbacks and other special dimensioning; interior partitions shall be located and dimensioned, including location of doors and swings; extents and rating of all fire-rated partitions shall be clearly indicated on plans; floor/slab elevations shall be indicated. Larger scale plans for core elements shall be provided, including stairs, elevators, shafts, and lavatories. Building elevations indicating vertical elevations and floor heights,

fenestration, exterior finishes column locations shall be provided. Sections indicating overall building longitudinal and traverse, typical walls with foundation and perimeter treatments, window location and insulation, and parapet shall be provided. Equipment schedules shall be laid out to receive schedule information such as doors, hardware, room finishes, windows, and others as may be necessary.

Fire Protection drawings shall provide floor plans for fire protection systems, showing location and approximate size of all major equipment; layout of major duct, pipe mains, and standpipe including locations of all flow measuring devices; sizes and locations of slab and wall penetrations required for chases and louvers. Fire Protection plans shall show the location and hazard class of each sprinkler zone, and show standpipe locations. Provide demolition plans with a similar level of detail for any existing systems to be removed or modified.

Plumbing drawings shall provide floor plans for all plumbing systems, showing location and approximate size of all major equipment; layout of major pipe mains including sizes and locations of slab and wall penetrations required. Provide demolition plans with a similar level of detail for any existing systems to be removed or modified.

Mechanical drawings shall provide floor plans for all HVAC, supply and exhaust systems, showing location and approximate size of all major equipment; layout of major duct and pipe mains including locations of all flow measuring devices; sizes and locations of slab and wall penetrations required for chases and louvers. For each smoke removal, HVAC and exhaust system, provide a flow diagram with a concise description of the proposed system operation (this will be the basis for the Operating and Maintenance review and for the further development into the UCS drawing for the system), and a key plan showing the area(s) served by the system.
Demolition plans with a similar level of detail for any existing systems to be removed or modified shall be provided.

Electrical drawings shall provide developmental lighting plans, power plans, and location of switch gear/substation, power panels, and cable trays. Electrical service equipment shall be identified, including transformer KVA ratings. Preliminary one-line diagrams shall be included. Drawings shall show electrical rooms, communication equipment rooms, and major equipment. Provide demolition plans with a similar level of detail for any existing systems to be removed or modified.

5.6.4 Construction Cost Estimates:

Each construction line item shall be broken out separately.

5.6.5 Calculations:

Calculations shall include a tabulation of the design criteria used for each discipline. Fire Protection, plumbing, heating/cooling load calculations shall be provided. Structural calculations shall be provided. Electrical load calculations shall be provided. Short

circuit calculation shall be performed. Total utility requirements shall be tabulated, including power, chilled water, steam, water, storm and sanitary sewer; and adequacy of existing utilities for proposed connection shall be confirmed. Pipe and duct sizing calculations for mains shall be shown.

5.6.6 CADD Database:

CADD Database shall utilize the CADD Standards requirements in structure and detail. Layering shall follow conventions, file naming shall be as indicated, and model/drawing structure shall utilize XREF commands as indicated.

5.6.7 Preliminary Definition Rating Index (PDRI):

Unless specified otherwise in a task, the A-E shall be required to participate in a Preliminary Definition Rating Index (PDRI) meeting. The PDRI is a useful tool that is performed at the 35% design submission. A score of greater than 200 will preclude the A-E from proceeding with design process until issues are resolved from the PDRI conference. More information about the PDRI can be found at:

http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/ProjectDefinitionRatingIndex.pdf

The PDRI meeting will occur at GSFC and will include all major stakeholders in the project.

5.6.8 Architectural Discipline Review Committee:

As required by individual task, the A&E shall prepare documentation for presentation to the ADRC as outlined in the Standard Reference Document (SRD). ADRC is non-applicable for Wallops Flight Facility (WFF).

5.6.9 National Capitol Planning Commission:

As required by individual task, the A&E shall prepare documentation for presentation to the NCPC as outlined in the Standard Reference Document (SRD). NCPC is non-applicable for Wallops Flight Facility (WFF).

5.7 60% Construction Documents:

5.7.1 Environmental Requirements:

Any NEPA requirements associated with an Environmental Assessment not already done shall be completed. Wetland mitigation plan shall be completed. Final Forest Stand Delineation and Forest Conservation Plan shall be completed. Final Permit to Construct Application shall be completed. Asbestos or lead abatement plan shall be completed. Unless specified otherwise, the above requirements in 5.7.1 will be required.

5.7.2 Specifications:

Provide a complete printed set of Project Specifications with:

- Project Table of Contents;
- Section Tables of Contents;
- Specifications sections, showing designer notes, red line additions, deletions, and modifications.

Government review of the specifications will focus primarily on issues of standardization, design concepts or systems, consistency, and GSFC policy. The A&E shall edit the specifications as necessary to ensure proper technical content.
In addition to the hardcopy markup as indicated above, the A&E shall also submit a Specsintact electronic database that uses the Specsintact Backup software routine. This database shall be reviewed to ensure proper Specsintact procedures were followed.

5.7.3 Drawings:

The package shall include all sheets, but not necessarily all drawings, required in the final set. Drawings shall be fully developed to 60 percent level. Most conflicts between the various disciplines shall have been eliminated so that the set itself shall be internally consistent. Required utility outages shall be indicated in an Outage Table, identifying all significant types, duration, impacts, and points of isolation. Resolution of conflicts with the project specifications shall have begun.

General drawings shall include title sheet and standard legend and abbreviation sheets edited to remove extraneous information.

Hazardous material drawings shall show location of hazardous materials impacted by work related to a project. Notes on drawing shall describe nature and type of hazardous material and refer to specification sections describing the mitigation and controls involved in abatement/encapsulation of the specific materials.

Civil drawings shall show all demolished work, site layout with all dimensions, grading and drainage plans, spot elevations where necessary, utility profiles; development of details shall be continued; comprehensive schedule information shall be shown. Stormwater Management Report and drawings and erosion and sediment control drawings shall be complete and ready for submission to the State of Maryland and/or Virginia.

Landscaping drawings shall include all areas of open planting with designations, spacing, and quantity, hardscaping and planter locations, and preliminary schedules of plantings.

Structural drawings shall provide comprehensive footing, pedestal, base plate, beam, and column schedules; framing plans with all members shown, top of steel elevations, plan view and elevation views, rebar schedule, other concrete and/or steel details, and completed General Structural Notes.

Architectural drawings shall provide all floor plans, with major dimensions, including those for fenestration; noted or keyed interior partition types; keys for larger-scale plans

and plan details; larger-scale plans of special spaces such as lobby(ies); cores, stairs, and elevators, dimensioned, partially noted, and keyed for details; complete stair sections, keyed for details and clearly showing maintenance of integrity of fire separation at fire stairs; stair details, dimensioned, and for monumental stairs, noted; built-in furniture items, such as reception desks, counters, cabinets, worktops, lockers, and special furniture and equipment (except for systems furniture), drawn to scale and keyed for details; Government-Furnished Equipment shall be marked for easy identification and clarification, and keyed to a schedule. Finished building elevations, keyed for building sections, all wall sections, window types, glazing types, louver numbers; all wall sections keyed for details, dimensioned, and partially noted. Blocked-out versions of all exterior closure details, including roof details, blocked-out window elevations, louver elevations, storefront elevations, dimensioned and keyed for details; blocked out interior elevations of special spaces, keyed for details. Reflected ceiling plans for special spaces, integrated to reflect structural, mechanical, and electrical impacts, and indicating lighting layouts; soffits, coves, furrings out; skylight locations, if any; interface with windows; register and diffuser locations; sprinkler head locations; access panels; acoustical treatments and ceiling materials; ceiling heights; "typical" reflected ceiling plan indicating rules for layout of acoustical grid and lighting. Comprehensive schedules for pre-final interior finishes, frames and doors, most hardware sets, window and glazings, and other necessary schedules; and toilet room plans and elevations (if required) keyed for details, with equipment indicated via a fixtures schedule.

Fire Protection drawings shall show locations of all flow and tamper switches, coordinated with fire detection systems; supply connections and locations of risers and mains; location and performance requirements of fire pump and controller if required. Hydrant Flow data shall be shown on drawings.

Plumbing drawings shall show the location of all drains, cleanouts, and fixtures, coordinated with the architectural drawings and keyed to the specification. Process piping drawings shall show the location of process equipment.

Mechanical drawings for all HVAC, supply and systems, shall include floor plans revised as necessary for coordination with other disciplines; sections, elevations, and details as required to show system arrangement and interface with other disciplines; layout and size of branch ducts and piping, roof plans, enlarged mechanical room plans, and mechanical room sections as needed to show location, size and arrangement of all mechanical equipment; equipment schedules with sizing data and performance requirements, as determined from the 60 percent calculations; list all FMD standard schedules and details to be included in the final drawing package; show preliminary development of any non-standard schedules or details which will be required. Schematic drawings for each system shall be included.

HVAC and exhaust system drawings shall show all chillers, cooling towers, fans, coils and terminal equipment; all air distribution devices, coordinated with architectural reflected ceiling plans and electrical lighting layouts. All fire and/or smoke dampers at rated-wall and slab penetrations; section or elevations of air-handling units; and identification of any non-ducted air paths or plenums, coordinated with architectural plans and details. Include diffuser, grill, and other equipment schedules not shown on 30% drawings.

UCS drawings for each HVAC and exhaust system shall include control devices; full written sequence of operation; indication of the scope of the UCS contractor's work and of any interconnecting work within the general contractor's scope including coordination with smoke detection system.
Demolition drawings with a similar level of information for any existing systems to be removed or modified shall be provided.

Electrical drawings shall show outlets, lighting layouts, locations of unit substations, lighting and power panelboards, and motor control center (MCC), including associated feeder sizes; communications and electrical closets; building control, grounding, lightning protection, and signal systems. Submission shall include power, fire alarm, telephone/data, and security riser diagrams. All electrical drawings to be included in the complete set shall be included in this submission, although development of panelboard schedules, MCC schedules, and other specific details are not required. Include the electrical-one-line diagrams. Demolition drawings with a similar level of information for any existing systems to be removed or modified shall be provided.

5.7.4 Construction Cost Estimate:

Each construction line shall be broken out separately. In addition, any additive alternates necessary to ensure a successful bid shall be identified and costed separately.

5.7.5 Calculations:

Provide lighting and electrical load calculations. Provide Stormwater Management calculations in report format suitable for submission to MDE. Provide Stormwater Management calculations in report format suitable for submission to the Virginia Department of Conservation and Recreation. Provide suitable wastewater process design calculations to Virginia Department of Environmental Quality. Provide potable water system design calculations for approval by the Virginia Department of Health. Structural calculations shall be revised as necessary. Mechanical calculations shall be revised as necessary, and shall also include duct and pipe-sizing calculations for all mechanical and plumbing systems; each keyed to a system diagram.

5.7.6 Equipment Data Book:

Equipment Data Book shall include all mechanical and electrical equipment, indicating model/features selected and data used for the basis of design.

5.7.7 Architectural Color Book:

Architectural Color Book shall be provided with alternate availability of materials/colors for selection by the Government.

5.8 90% Construction Documents

5.8.1 Specifications:

Provide a complete set of Project Specifications with Table of Contents.

All specifications sections shall be edited without designer notes, incorporating all previous comments and notations. Any new additions, deletions, or modifications shall be in red line format. Any new sections shall be submitted with designer notes intact, with red line additions, deletions, and modifications. In addition to the hardcopy markup as indicated above, the A&E shall also submit a Specsintact electronic database that uses the Specsintact Backup software routine. This database shall be reviewed to ensure proper Specsintact procedures are followed.

5.8.2 Drawings:

This submission shall be 100 percent complete, lacking only a final review by the Government. Submission shall include all plans, details, sections, elevations, profiles, schedules, operational sequences, and other details necessary to define the work completed and internally coordinated. Electrical Panelboard, MCC and Switchgear Schedules shall indicate connected and demand loads.

5.8.3 Cost Estimate:

Cost estimate shall be complete, itemized in every detail, clearly segregating bid additives, alternates, options, or other work package requirements.

5.8.4 Calculations:

Calculations shall be completed and clearly organized for all disciplines. Final calculations shall be provided in 3-ring loose-leaf binders with a Table of Contents.

Electrical final one-line diagrams with the protective relaying scheme, computerized short circuit analysis (covering one, three, and five cycles), coordination study, final building load calculations, protective device settings and ground fault current calculations shall be submitted.

5.8.5 Construction Schedule:

Construction schedule shall be complete, with all activity relationships defined, tied, and milestones indicated.

5.8.6 Equipment Data Books:

Equipment Data Books shall be completed, fully developed, labeled, and marked with appropriate features. For unique, specialized equipment, or equipment with other restrictions, it shall be clear that there exists more than one source for the equipment or

material. A listing of all single source and/or proprietary materials or equipment shall be provided.

5.8.7 Architectural Color Book:

Architectural Color Book shall be complete. A listing of all-single source and/or proprietary materials shall be provided.

5.9 100% Construction Documents:

The 100% construction documents prepared by the A&E shall be complete in all details so as to enable prospective bidders to prepare itemized and detailed estimates for the required work. It is essential that the drawings and specifications be accurate and explicit and that they provide an equitable basis for the bid.

Original mylars submitted at 100 percent submission shall be plotted on Mylar (3 mil minimum, matte finish on top), of ISO size indicated, stamped and sealed by a Professional Engineer. Electronic final drawings and specifications shall also be submitted.

6.0 FOLLOW-ON SERVICES

The A&E shall provide the follow on services as required in the individual task and as outlined below.

6.1 Answer Questions:

The A&E shall answer questions in writing when requested by the Contracting Officer (CO), and provide drawings and sketches to clarify the intent or interpret the drawings and specifications, during the bidding period and after it, in response to Requests for Information (RFIs). The A&E shall respond to RFIs so as to achieve a prompt turnaround, including the preparation or modification of drawings and specifications amending the bid documents and the analysis and evaluation of proposals from RFI's related change orders. See Deliverables (Section 7.0) for response turnaround times. Responses, drawings, and sketches shall be transmitted to GSFC by email, facsimile, overnight mail, or courier service.

6.2 Analyze and Evaluate Proposals:

Assist the CO, PM, and Contracting Officer's Technical Representative (COTR) in analyzing the initial construction proposal and subsequent proposals, which may be issued to resolve conflicts, errors, and omissions, contained in the drawings and specifications.

6.3 Check and Recommend Actions on Shop Drawings, Submittals, and Proposed Substitutions:

The A&E shall perform a detailed review of the shop drawings, submittals, and proposed substitutions submitted by the construction contractor. The A&E shall assume responsibility for careful checking of the accuracy of the contractor's submittals against

the construction documents and any addenda, and shall recommend approval actions to the Government. The A&E shall receive directly from the construction contractor, two sets of submittals. The A&E shall return one set, fully reviewed and stamped with recommended action, to GSFC. All submittals shall be transmitted to GSFC via overnight mail or courier service.

6.4 Additional Details or Detailed Drawings:

The A&E shall prepare any additional details or detailed drawings as required to resolve conflicts, errors, and omissions contained in the drawings and specifications and submit them to the government.

6.5 Develop Record (As-Built) Drawings:

The Government shall furnish the A&E with one set of redline markups received from the construction contractor. The A&E shall revise the original electronic design database and composite database drawings to show construction as actually accomplished.

7.0 DELIVERABLES

Deliverables shall be as follows unless stated otherwise in the individual task. Days are calendar days.

All submittals shall be submitted to the COTR in hardcopy format unless indicated as an electronic submission.

Review meeting dates shall be provided by the A&E as a part of the proposed schedule. Review meetings shall be held at GSFC (Greenbelt or WFF location). Meeting duration shall be as necessary to adequately review and dispense all comments generated by the Government's review of the documents.

7.1 General Documents:

7.1.1 Project Schedule:

The Project Schedule shall be provided within [10] working days after contract award. The schedule shall be compatible with MS Project and shall be updated by the tenth day of each month to show the actual progress against the original schedule, including discussion of the monthly status.

Project Schedule	[1] electronic set [1] printed set

7.1.2 Consultation and Advice:

Consultation and Advice shall be provided on an as-needed basis. Records of consultation and advice shall be submitted within [2] working days.

Submittal Requirements Record	[1] electronic set

7.1.3 Minutes, Records, and Discussions:

Records of Minutes, Records, and Discussions shall be provided no later than [2] working days after event. For minutes of large meetings or design reviews, the Record shall be submitted no later than [1] week after event.

Submittal Requirements Record	[1] electronic set [1] printed set

7.1.4 Pre-Proposal Conference:

The Pre-proposal conference shall be held approximately [2] weeks after selection for the individual task. One day shall be scheduled for this conference.

7.1.5 Project Kick-Off/Partnering Meeting:

The Project Kick-Off meeting shall be held within the first [2] weeks after award of the individual task. Depending on the requirements of the individual task, the partnering session will also be held on this day.

7.2 Engineering and Special Studies Documents

Specific Engineering and Special Studies Deliverables will be identified and requested in each individual task.

7.2.1 50% Engineering Studies Submittal:

The Government shall receive the submittal as determined by the individual task. The Government shall provide review comments to the A&E within [14] calendar days. A 50 percent review conference shall be held within [7] calendar days after return of review comments as required by task. The A&E shall return the review comments with responses and actions noted, within [7] calendar days after review conference.

Engineering Studies	[5] printed sets [1] electronic set
Review Conference (As required)	[1/2] day

7.2.2 90% Engineering Studies Submittal:

The Government shall receive the submittal as determined by the individual task. The Government shall provide review comments to the A&E within [14] calendar days. A 90 percent review conference shall be held at GSFC within [7] calendar days after return of review comments as required by task. The A&E shall return the review comments with responses and actions noted within [7] calendar days after review conference.

Engineering Studies	[5] printed sets [1] electronic set
Review Conference (As required)	[1/2] day

7.2.3 100% Engineering Studies Submittal:

The submittal shall be received by the Government [2] calendar days after providing preview 100 percent comments to the A&E.

Special or Engineering Study	[7] sets

7.3 Preliminary Engineering Report (PER)

7.3.1 50% Preliminary Engineering Report Submittal:

The Government shall receive the submittal as determined by the individual task. The Government shall provide review comments to the A&E within [14] calendar days. A 50 percent review conference shall be held within [7] calendar days after return of review comments as required by task. The A&E shall return the review comments with responses and actions noted, within [7] calendar days after review conference.

50% PER	[5] printed sets [1] electronic set
ADRC Presentation Material (N/A WFF)	[6] printed sets [1] electronic set
NCPC Presentation Material (N/A WFF)	[6] printed sets [1] electronic set

Review conference durations to be determined by individual task

50% Review Conference (As required)
ADRC Conference (As required)
NCPC Conference (As required)

7.3.2 90% Preliminary Engineering Report Submittal:

The Government shall receive the submittal as determined by the individual task. The Government shall provide review comments to the A&E within [14] calendar days. A 90 percent review conference shall be held at GSFC within [7] calendar days after return of

review comments as required by task. The A&E shall return the review comments with responses and actions noted within [7] calendar days after review conference.

90% PER	[5] printed sets [1] electronic set

Review conference durations to be determined by individual task
90% Review Conference (As required)

7.3.3 100% Preliminary Engineering Report Submittal:

The submittal shall be received by the Government [2] calendar days after providing preview 100 percent comments to the A&E.

100% PER	[7] sets

7.4 Final Design Documents:

7.4.1 35% Submittal:

The Government shall receive the submittal as determined by the individual task. The Government shall provide review comments to the A&E within [1] calendar days. The final ADRC Review Conference (N/A WFF Location) shall be scheduled prior to the 35 percent review. A 35 percent review conference shall be held within [7] calendar days after return of review comments. Long Form Write-up graphics will be revised as necessary. The A&E shall return the review comments with responses and actions noted, within [7] calendar days after review conference. Unless directed otherwise, the A&E shall attend the Project Definition Rating Index (PDRI) Review Conference within [7] calendar days after returning the review comments with responses and actions noted.

Submittal Requirements as determined by individual task

Specification	[3] printed sets
Drawings	[14] printed sets
Cost Estimate	[3] printed sets
Calculations	[3] sets
Construction Schedule	[1] electronic set
Construction Schedule	[1] printed set
CADD Database	[1] electronic database
Preliminary Color Architectural Rendering	[5] sets
ADRC Presentation Material (N/A WFF)	[6] printed sets [1] electronic set
NCPC Presentation Material (N/A WFF)	[6] printed sets

[1] electronic set

Review conference durations to be required per individual task
ADRC Review Conference (As required)
NCPC Review Conference (As required)
Project Definition Review Conference (PDRI) Conference
35% Review Conference

7.4.2 60% Submittal:

The Government shall receive the submittal as shown in the approved A&E schedule. The Government shall provide review comments to the A&E within [14] calendar days. A 60 percent review conference shall be held within [7] calendar days after return of review comments. The A&E shall return the review comments with responses and actions noted, within [7] calendar days after review conference.

Specifications	[5] printed sets
Specifications	[1] electronic database
Drawings	[14] printed sets
Cost Estimate	[3] printed sets
Calculations	[3] sets
Equipment Data Books	[6] printed sets
Architectural Color Book	[3] sets
Environmental Documentation	[3] sets

Review conference durations to be determined by individual task
60% Review Conference

7.4.3 90% Submittal:

The Government shall receive the submittal as indicated in the approved A&E schedule. The Government shall provide review comments to the A&E within [14] calendar days. The ADRC Review Conference shall be scheduled prior to the 90 percent review. A 90 percent review conference shall be held within [7] calendar days after return of review comments. The A&E shall return the review comments with responses and actions noted, within [7] calendar days after review conference.

Specifications	[5] printed sets
Specifications	[1] electronic database

Drawings	[14] printed sets
Cost Estimate	[3] printed sets
Calculations	[3] sets
Construction Schedule	[1] printed set
Construction Schedule	[1] electronic
Equipment Data Books	[6] printed sets
Architectural Color Book	[3] sets
Final Color Architectural Rendering	[5] sets
Display Model (As required)	[1] model

Review conference durations to be determined by individual task
ADRC Review Conference (N/A WFF)
90% Review Conference

7.4.4 100% Submittal:

The Government shall receive the submittal as shown in the approved A&E schedule. Submittal Requirements or as indicated in individual task order.

Specifications	[7] printed bound sets
Specifications	[1] printed set ready for duplication
Drawing	[14] printed sets
Half-size Drawings	[14] printed sets
Cost Estimate	[3] printed sets
Calculations	[3] printed sets
Equipment Data	[6] printed sets (if different from 90%)
Architectural Color Book	[3] sets (if different from 90%)
CADD Database	[1] electronic database
PDF Format Drawing File	[1] electronic PDF file
Composite Drawing Database	[1] electronic database
Specsintact Database	[1] electronic database
Original Mylars	[1] signed & stamped printed set

7.5 Follow-on Services Documents:

Follow-on services shall be provided, as needed, throughout the extent of the construction contract and as defined in the individual task.

7.5.1 Answer Questions:

For questions received during the bidding phase, the Government shall receive the submittal within [2] working days from when the submitted question was received by the A&E. For Requests for Information (RFI's) during the construction period, the submittal shall be received by the Government within [5] working days from when the question was received by the A&E.

Record	[1] printed set
Record	[1] electronic set

7.5.2 Analyze and Evaluate Proposals:

The Government shall receive the submittal within [2] working days of receipt of documentation by the A&E.

Record	[1] printed set
Record	[1] electronic set

7.5.3 Shop Drawings, Submittals, and Substitutions:

The Government shall receive the submittal within [5] working days of receipt of documentation by the A&E.

Original Contractor Material	[1] set
Record or Drawing	[1] set

7.5.4 Additional Details or Detailed Drawings:

The Government shall receive the submittal within [5] working days of being notified by the Government.

Record or Drawing	[1] printed set
Record or Drawing	[1] electronic database

7.5.5 As-Built Drawings:

The submittal shall be received by the Government [4] weeks after turning over Contractor's redlined mark-ups to A&E.

CADD Database	[1] electronic database
Composite Drawing Database	[1] electronic database
Mylar Drawings	[1] set

8.0 MINIMUM TEAM QUALIFICATIONS

8.1 Team: The Contractor shall provide team members that meet the following qualifications (as required):

8.1.1 **Principal-in-Charge** shall be a registered professional engineer or architect, have a degree in engineering or architecture with at least 10 years experience including experience providing staff direction on at least 1 Government project.

8.1.2 **Project Manager** shall be a registered professional engineer or architect, have a degree in engineering or architecture with experience leading interdisciplinary coordination and management of architectural/engineering efforts for large projects, including experience on at least 1 Government project.

8.1.3 **Architect** shall be a registered architect, have a degree in architecture with experience including managerial experience in planning and conceptual design, architectural design development, detailed design and the production of contract documents for governmental and institutional projects assuring proper code compliance and construction documentation coordination on at least 1 Government project. Architect shall also have experience in designing and developing program documents, concept drawings, preliminary design documents, space planning, code analysis, final construction documentation, and construction administrative services. Project Architect will be responsible for design of all architectural systems and shall be LEED certified.

8.1.4 **Landscape Architect** shall be a registered landscape architect and have a degree in landscape architecture.

8.1.5 **Mechanical Engineer** shall be a registered professional engineer, have a degree in mechanical engineering or related field with experience on at least 1 Government project designing mechanical and process systems, working with site utility systems, and designing for compliance with energy conservation standards. Lead Mechanical Engineer shall have experience in design of site and building mechanical systems and providing quality assurance oversight and coordination of mechanical engineer's design with other disciplines. Lead Mechanical Engineer will be responsible for the design of all mechanical systems.

8.1.6 **Plumbing Engineer** shall be a registered professional engineer, have a degree in mechanical engineering or related field with experience on at least 1 Government project designing waste, drainage, sanitary, and gas systems. Lead Plumbing Engineer shall have experience in the design of site and building systems and shall provide quality assurance oversight and coordination of plumbing engineer's design with other disciplines. Lead Plumbing Engineer will be responsible for the design of all plumbing systems.

8.1.7 **Electrical Engineer** shall be a registered professional engineer, have a degree in electrical engineering or related field with experience on at least 1 Government project designing electrical systems including underground power distribution, unit substations, standby and prime power generation, interior and exterior lighting and controls, primary and secondary power distribution, communication systems, grounding, fire detection, fire protection, intrusion detection, security systems, telecommunication, uninterruptable power supply systems and designing for compliance with energy conservation standards.

Lead Electrical Engineer shall have experience in design of site, building and laboratory electrical systems and providing quality assurance oversight and coordination of electrical engineer's design with other disciplines. Lead Electrical Engineer will be responsible for the design of all electrical systems.

8.1.8 **Structural Engineer** shall be a registered professional engineer, have a degree in structural engineering or related field with experience with at least one Government project designing and reviewing conceptual structural designs both in concrete and steel construction. Lead Structural Engineer shall have experience in design of site and building structural systems and providing quality assurance oversight and coordination of structural engineer's design with other disciplines. Lead Structural Engineer will be responsible for the design of all structural systems.

8.1.9 **Civil Engineer** shall be a registered professional engineer, have a degree in Civil engineering or related field with experience with at least one Government project designing and reviewing civil infrastructure systems including sewer systems, drainage channels, stormwater management, grading, roadway development, parking lots, and sediment control measures. Lead Civil Engineer shall have experience with the Maryland Department of Environment (MDE), Virginia Department of Environmental Quality (DEQ), the Maryland and Virginia Department of Natural Resources (DNR), U.S. Army Corps of Engineers, Virginia Department of Conservation and Recreation, and the Virginia Department of Health. Lead Civil Engineer shall have experience in design of site infrastructure systems and providing quality assurance oversight and coordination of civil engineers design with other disciplines. Lead Civil Engineer will be responsible for the design of all civil systems.

8.1.10 **Fire Protection Engineer** shall be a registered professional fire protection engineer with experience on at least one Government project in analyzing and designing a variety of fire protection systems, fire hazard and risk assessments and adherence to Government and Code standards and guidelines. Lead Fire Protection Engineer shall have experience in design of fire protection systems and providing quality assurance oversight and coordination of fire protection engineer's design with other disciplines. Lead Fire Protection Engineer will be responsible for the design of all fire protection systems.

8.1.11 **Administrative Assistant** shall have working knowledge of Microsoft Windows or equivalent word processing software.

8.1.12 **Interior Designer shall** have a degree in interior design.

8.1.13 **CAD Drafter** shall have a minimum of 3 years experience in CAD design and drafting. CAD technician shall be proficient in software packages used by A&E and shall be able to demonstrate proficiency and compliance with the NASA CADD Manual which will be provided after successful award.

8.1.14 Industrial Hygienist shall have a bachelor's degree in Industrial Hygiene, Occupational Safety, Health and Safety or other physical science field. IH shall have a minimum of 6 years experience in construction renovation projects and shall be a Certified Industrial Hygienist (CIH) by the ABIH (American Board of Industrial Hygienist). IH shall be capable of taking field samples and providing testing of samples to determine remediation strategies for renovation projects.

8.1.15 Process Engineer shall have a degree in chemical engineering or related field with experience designing process support systems such as process waters, waste handling, water reclamation and reuse, bulk and specialty gases handling and delivery, and process exhaust and abatement systems on at least one Government project.

8.1.16 Environmental Engineer shall be a registered professional engineer, have a degree in environmental engineering or related field and shall be familiar and have experience with working with the Maryland Department of the Environment (MDE), Virginia Department of Environmental Quality (DEQ), the Maryland and Virginia Department of Natural Resources (DNR), the Virginia Department of Conservation and Recreation, the Virginia Department of Health, and the U.S. Army Corps of Engineers.

8.1.17 Geotechnical Engineer shall be a registered professional engineer, have a degree in civil engineering or related field including experience in foundation earthwork analysis, due diligence studies, characterization and remediation of contaminated sites, and subsurface investigations.

8.1.18 Cost Estimator shall be a member of the American Society of Professional Estimators or the American Association of Cost Engineers with experience in preparing budgets, conceptual and detailed cost estimating, elemental analysis, value engineering, life-cycle costing, and claims and change order negotiations.

8.1.19 Specifications Writer shall be a registered architect or engineer with a bachelor's degree including experience in the development and writing of specifications, the quality assurance monitoring of the quality and integrity of project documentation through all project phases on at least 1 Government project.